



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,569	03/09/2004	Arne Berg	WEAT/0471.P1	2474
36735 7590 08/23/2007 PATTERSON & SHERIDAN, L.L.P. 3040 POST OAK BOULEVARD, SUITE 1500 HOUSTON, TX 77056			EXAMINER PAK, SUNG H	
			ART UNIT	PAPER NUMBER
			2874	
			MAIL DATE	DELIVERY MODE
			08/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/796,569

Applicant(s)

BERG ET AL.

Examiner

Sung H. Pak

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13, 15-36 and 38-46 is/are pending in the application.
- 4a) Of the above claim(s) 2-5, 27-30 and 40-46 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 33-36, 38 and 39 is/are allowed.
- 6) ☒ Claim(s) 1, 6-13, 15-26, 31 and 32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17:2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Applicant's amendment filed 6/08/2007 has been entered. All pending claims have been carefully reconsidered in view of the amendment.

Response to Arguments

Claim 1 and its dependent claims:

Claim 1 is now amended to recite, *inter alia*, "wherein the mandrel **pre-defines** at least one groove for routing the optical fiber." (emphasis added) Although *Hay et al.* (US 6,278,811 B1) does not appear to explicitly state that the mandrel has "pre-defined" grooves for routing optical fibers, such feature is rendered obvious by *Hay et al.*, and accordingly, a new ground of rejection is presented in this office. Since the new ground of rejection was necessitated by the claim rejection, the rejection is made final.

Claim 21 and its dependent claims:

On page 9 of applicant's response, it is argued that *Hay et al.* does not disclose the mandrel as being non-rigidly mounted to the housing.

The examiner respectfully submits that *Hay et al.* fully discloses such feature, and the claimed limitations, as they are currently recited in claim 21, are fully anticipated by *Hay et al.* As discussed in the previous office action, *Hay et al.* clearly discloses the use of an O-ring for coupling the mandrel to the housing (see Fig. 4). Further, column 7 lines 3-7 of *Hay et al.* discloses that the O-ring provides for hermetic seal between the housing interior and the exterior.

Art Unit: 2874

Such hermetic sealing can only occur when the O-ring is a compliant member. Therefore, *Hay et al.* fully discloses the mandrel “non-rigidly” coupled to the housing via the O-ring member.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 21-26, 31-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Hay et al (US 6,278,811 B1).

Hay reference discloses an apparatus for sensing pressure in fluidic media, comprising a housing (‘18’ Fig. 1) enclosing a liquid (column 5, lines 5-7; column 5, lines 18-22); a diaphragm attached to the housing wherein the diaphragm transmits the acoustic pressures from the fluidic media to the liquid (column 5, lines 11-12; column 5, lines 18-22); an optical sensor positioned within the liquid for sensing the pressures in the liquid (‘12’ Fig. 1; column 5, lines 8-10);

further comprising a filler member within the housing for reducing the volume of the liquid enclosed in the housing (the “filler” member being ‘55’ in Fig. 4: this “filler member” enclosed within the housing makes the element ‘12’ larger, and therefore, reduces the volume of the liquid occupying the space ‘56’ in Fig. 4);

Art Unit: 2874

wherein the sensor is affixed to a mandrel (the 'sensor' being the grating fiber element such as '35' in Fig. 4, and the mandrel being '12', as discussed in column 6, lines 53-57), the mandrel non-rigidly coupled to the housing using at least one O-ring (the mandrel is coupled to the housing via various elements (including '21', '20' in Fig. 4), one of which is an O-ring '40' in Fig. 4);

wherein the sensor comprises a coil of optical fiber grating wound around a mandrel (Fig. 8; column 8, lines 42-45);

wherein the housing further comprises a sealed feed-through for passing an optical fiber to the interior of the housing ('25' Fig. 4; column 7, lines 11-12);

wherein the mandrel defines at least one tunnel from one end of the mandrel to another end for routing of an optical fiber (Fig. 8; column 8, lines 42-56);

wherein the mandrel defines at least one groove for routing optical fibers (column 8, lines 51-56: fibers "partially fused into the surface" of the mandrel will inherently create "grooves" on the surface of the mandrel);

wherein the housing has at least one port to introduce the liquid therein, the at least one port selectively opened and closed by at least one valve ('60' in Fig. 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 6, 8-13, 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hay et al (US 6,278,811 B1).

Hay reference discloses an apparatus for sensing pressure in fluidic media as discussed above. However, it does not explicitly teach the use of pre-defined grooves on the mandrel, as grooves shown in Hay are formed while optical fibers are wound on the mandrel.

On the other hand, the use of pre-defined grooves in fiber mandrels is well known and common in optical fiber arts. Pre-defined grooves in fiber mandrels are well known to be advantageous and desirable by ordinary skilled artisans in the optical fiber arts, because they allow for secure placement of optical fibers on mandrels and limit any undesirable movement of optical fibers. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the device of Hay to have pre-defined grooves on the fiber mandrel in the manner claimed.

Art Unit: 2874

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hay et al (US 6,278,811 B1).

Hay reference discloses an apparatus for sensing pressure in fluidic media as discussed above. However, it does not explicitly teach the use of a pin for coupling the mandrel to the housing. On the other hand, the use of pins for securing mechanical components in fiber optic sensing device is well known and common in the art. The use of securing pins in mechanical structure is well known to be advantageous and desirable in the art because they allow for structurally simple and low cost means of securely coupling plurality of mechanical structures. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the device of Hay to use a pin.

Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hay et al (US 6,278,811 B1) in view of Mendez et al ("Micromachined Fabry-Perot interferometer with corrugated silicon diaphragm for fiber optic sensing applications").

Hay reference discloses an apparatus for sensing pressure in fluidic media as discussed above. However, it does not explicitly teach the use of a corrugated diaphragm disposed between the housing and a ring.

On the other hand, Mendez reference explicitly teach fiber optic sensing device for sensing pressure (Introduction- page 170), wherein the diaphragm is corrugated and disposed between the housing and a ring (Figs. 1, 2, and 3 on page 180). Mendez reference discloses that such configuration is advantageous and desirable because it allows for highly sensitive yet compact and lightweight fiber optic sensing device (abstract).

Art Unit: 2874

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the device of Hay to have a corrugated diaphragm disposed between the housing and a ring.

Allowable Subject Matter

Claims 33-36, 38-39 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: As discussed previously, an optical fiber pressure sensor apparatus having a housing enclosing a liquid, and an optical fiber wound around a fiber mandrel, is known in the art.

However, none of the prior art fairly teaches or suggests such optical fiber pressure sensor, further comprising, *inter alia*, an optical fiber routed through a pre-defined tunnel of a fiber mandrel, and then the same fiber is wrapped around the outside of the mandrel, in the manner claimed by the present application. In addition, there is no apparent reason why one of ordinary skill in the art would modify the existing prior art devices to have the above-mentioned feature, in the manner claimed in the instant application.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

Art Unit: 2874

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (571) 272-2353. The examiner can normally be reached on Monday- Friday, 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571)272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sung Pak/
Sung H. Pak
Primary Patent Examiner
Art Unit 2874